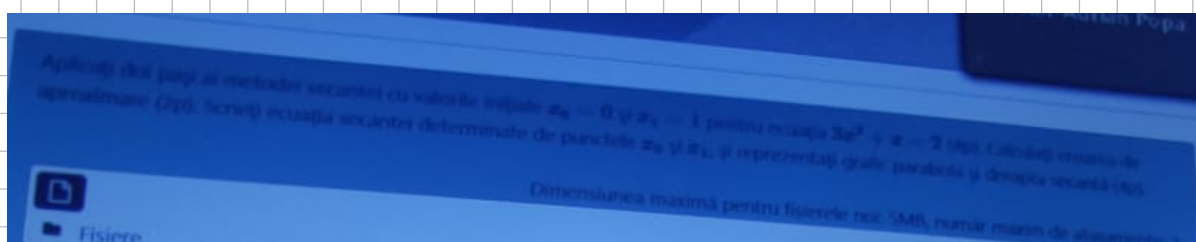


$$e_{i+1} \approx \left\| \frac{f''(x_i)}{2f'(x_i)} \right\| e_i e_{i-1}$$

→ convergență superliniară



$$x_0 = 0$$

$$x_1 = 1$$

$$f(x) = 3x^2 + x - 2$$

derivata

$$x_{i+1} = x_i - \frac{(3x_i^2 + x_i - 2)(x_i - x_{i-1})}{3x_i^2 + x_i - (3x_{i-1}^2 + x_{i-1})}$$

ecuația secantei drepte + Gf + Gd.

$$x_2 = 1 - \frac{3+1-2}{4} = \frac{1}{2} = 0,5$$

$$x_3 = \frac{1}{2} - \frac{\left(\frac{3}{4} + \frac{1}{2} - 2\right)\left(-\frac{1}{2}\right)}{\frac{5}{4} - 4} = \frac{1}{2} + \frac{\left(\frac{5}{4} - \frac{8}{4}\right)\frac{1}{2}}{\frac{5-16}{4}} = \frac{1}{2} + \frac{-\frac{3}{4} \cdot \frac{1}{2}}{-\frac{11}{4}} = \frac{1}{2} + \frac{3}{22} = \frac{14}{22} = \frac{7}{11} = 0,63$$

pt. rădăcini: $3x^2 + x - 2 = 0$, $\Delta = 1 + 24 = 25$

$$x_{1,2} = \frac{-1 \pm 5}{6} \rightarrow x_1 = -1$$

$$\rightarrow x_2 = \frac{2}{3} \leftarrow$$

$$f'(x) = 6x + 1 \rightarrow f'\left(\frac{2}{3}\right) = 4 + 1 = 5$$

$$f''(x) = 6$$

$$x_0 = 0 \quad e_0 = \left|0 - \frac{2}{3}\right| = \frac{2}{3}$$

$$x_1 = 1 \quad e_1 = \left|1 - \frac{2}{3}\right| = \frac{1}{3}$$

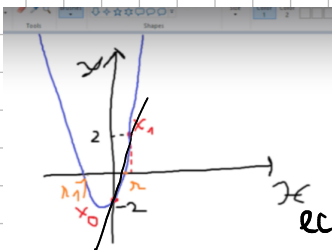
$$e_2 = \left|\frac{1}{2} - \frac{2}{3}\right| = \frac{1}{6} \quad e_2 \approx \left|\frac{6}{10}\right| \cdot e_1 \cdot e_0 = \frac{3}{5} \cdot \frac{2}{3} \cdot \frac{1}{3} = \frac{2}{15}$$

$$e_3 = \left|\frac{7}{11} - \frac{2}{3}\right| = \left|\frac{21-22}{33}\right| = \frac{1}{33} \quad e_3 \approx \frac{3}{5} \cdot \frac{1}{6} \cdot \frac{1}{3} = \frac{1}{30}$$

$$y - y_0 = m(x - x_0)$$

$$m = \frac{f(x_1) - f(x_0)}{x_1 - x_0} = \frac{2+2}{1} = 4$$

$$y = mx + m$$



$$y - f(x_0) = 4(x - 0)$$

$$y - f(x_1) = 4(x - 1)$$

$$\text{ec. secantei; } y + 2 = 4x \Rightarrow y = 4x - 2 \Leftrightarrow y - 2 = 4x - 4 \Rightarrow y = 4x - 2$$

$$1. \quad x_0 = 0$$

$$x_1 = 1$$

$$f(x) = x^3 + x - 1$$

$$x_{i+1} = x_i - \frac{(x_i^3 + x_i - 1)(x_i - x_{i-1})}{x_i^3 + x_i - (x_{i-1}^3 + x_{i-1})}$$

$$x_2 = 1 - \frac{1 \cdot 1}{1+1-0} = \frac{1}{2}$$

$$x_3 = \frac{7}{11} \quad \dots$$

Rândul 20

1. Aplicați metoda secanței pentru rezolvarea ecuației $x^4 = x + 10$, cu patru zecimale exacte. Verificați rezultatul folosind funcția fzero.

ans =

1.8556

$$x^4 = x + 10$$

$$f(x) = x^4 - x - 10$$

$$x_{i+1} = x_i - \frac{(x_i^4 - x_i - 10)(x_i - x_{i-1})}{x_i^4 - x_i - (x_{i-1}^4 - x_{i-1})}$$

```
>> xc = secant(f, - 0.6, 1.5, 10)
```

```
xc =
```

```
1.8556
```